



# Metal Mining

## 1998 TRI

### Public Data Release

#### *Questions, Answers and Facts*



*Since 1986, the Toxics Release Inventory (TRI) has collected information on the annual release and management of toxic chemicals from manufacturing facilities. The reporting requirements were recently expanded, and the 1998 version of the TRI contains the first reports from seven new industry sectors, including metal mining. This fact sheet is designed to help people understand the information reported by metal mines.*

#### **What are the reporting requirements for mines?**

The TRI regulations require metal mines to file reports documenting release amounts and waste management practices for every toxic chemical on the regulatory list used over threshold amounts. The reporting thresholds are 25,000 pounds for chemicals that are manufactured or processed and 10,000 pounds for chemicals that are otherwise used.

Some mining operations are not subject to TRI reporting. These include iron, uranium, radium, and vanadium mines, and all those with under ten employees.

#### **Why did metal mines report such large volumes of releases?**

Metal mines move, store, and dispose very large volumes of material. In order to get at an ore body, some mines must remove a large amount of submarginal ore, or waste rock, and dispose of it. This in itself is not an activity that would require reporting, but if a facility's other activities meet TRI reporting thresholds, the releases and other waste management of TRI chemicals in waste rock must be reported.

Some mines also produce tailings, which are the processed rock that remains after the target metal is extracted from the ore. Tailings often contain other metals that must be reported when disposed.

Because of the enormous amount of material moved and processed at mines, the amount of metal disposed, even at low concentrations, can be quite high.

#### **Why do some mines file reports for a long list of chemicals, while others report for only a few?**

TRI regulations require that mines calculate and provide release estimates only for chemicals for which they have exceeded manufacture, process, or otherwise use thresholds. Some ore beneficiation processes cause thresholds to be exceeded for all the metals present in the ore, requiring release reports to be prepared for each metal compound, while other processes do not.

#### **Why are the naturally-occurring metals in rock reported under TRI? Aren't mines just moving rock around and why is that hazardous to public health and the environment?**

Metal mining generates large quantities of waste rock which typically contains heavy metals (copper, arsenic, lead, etc.). These previously buried materials are exposed to the elements upon excavation and become susceptible to leaching by rain and snow. Unless carefully controlled and monitored, the leaching process can lead to ground and surface water sources contaminated with heavy metals and other toxic chemical pollution that would not have occurred naturally.

#### **Are the large piles of waste rock hazardous?**

This depends on the chemistry of the rock, the size of the particle, the precipitation, and most importantly, the mine's operating and waste management practices. The waste rock could either be relatively harmless or could lead to deterioration of surface and ground water, rendering this water unsuitable as a fishery, for irrigation, or for domestic and industrial use. A review of historical mines that have become Superfund sites indicates that in most cases, the primary cause of environmental damage comes from improperly managed waste rock and tailings dumps.

**Are these releases legal?**

The TRI report alone does not indicate whether the facility's release is legal. These releases must be compared with applicable permits to evaluate whether the facility is in compliance with other environmental regulations. Many of the releases included in the Toxics Release Inventory report are permitted by EPA and State Regulatory Agencies.

**Why do some mines have such high releases of cyanide?**

Sodium cyanide is used by many mines to leach gold out of ore. It is reportable as a member of the cyanide compounds category, and is released mostly to the land. As sodium cyanide degrades, hydrogen cyanide may be created and released to the air. However, hydrogen cyanide is a separately listed chemical, and under the TRI regulations, a facility must do separate threshold and release calculations for that chemical. In effect, a mine would report air releases of hydrogen cyanide only if more than 25,000 pounds of hydrogen cyanide were created. The quantity of cyanide used and released depends on the type of processing the mine uses.

**Isn't cyanide very toxic?**

Yes, cyanide is a very toxic material when inhaled as hydrogen cyanide or ingested orally as sodium cyanide or some other cyanide salt. Mines using cyanide to leach metals such as gold from rock are expected to employ strict controls over their use of cyanide and the generation of any waste that might contain cyanide. Open air facilities rarely, if ever, have a high enough concentration in the air to be a human health risk.

**Why are there stack air releases of mercury?**

Mercury is no longer used, as it had been historically, to remove gold from ore. Mercury is actually often found as a naturally occurring element in ore. It is generally leached out along with the gold, and must be removed as part of the refining process. Some facilities use heat to vaporize the mercury from the gold. Many mines capture and sell the mercury as a product.

**Many vitamin supplements contain metals like zinc and selenium. Why are they considered toxic at mines?**

Though metals are natural substances, in certain forms or concentrations they can be harmful to human health and/or the environment, and for that reason they are on the TRI reporting list.

Most creatures need trace amounts of many metals, while more concentrated forms can often be toxic. It is the concentration that matters, not the mere presence. Also, different species have different sensitivities. For example, wildlife is more sensitive to copper and selenium than humans. Even at low levels, selenium can cause reproductive problems for birds.

**How do I find out more?**

TRI is a starting point for learning more about the toxic chemical releases in your community. We will be more than happy to answer your questions and assist you in learning more about the TRI program and metal mining in Region 8.

Joyel Dhieux  
EPCRA/TRI Program Coordinator  
U.S. EPA Region 8  
303/312-6447

Jim Dunn  
Mine Waste Team Leader  
U.S. EPA Region 8  
303/312-6573

Carol Russell  
Mine Waste Team  
U.S. EPA Region 8  
303/312-6310

For more detailed information on the Toxics Release Inventory Program, visit EPA on-line at:

[www.epa.gov/tri](http://www.epa.gov/tri)

For more detailed information on the processes and environmental effects mining and metal processing, visit EPA on-line at:

[www.epa.gov/owm/permits/hrmining/index.htm](http://www.epa.gov/owm/permits/hrmining/index.htm)